



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,543	03/04/2002	Daisuke Kojima	112117	2272

25944 7590 10/18/2007  
OLIFF & BERRIDGE, PLC  
P.O. BOX 320850  
ALEXANDRIA, VA 22320-4850

EXAMINER
----------

PIZIALI, JEFFREY J

ART UNIT	PAPER NUMBER
----------	--------------

2629

MAIL DATE	DELIVERY MODE
-----------	---------------

10/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/086,543	<b>Applicant(s)</b> KOJIMA ET AL.	
	<b>Examiner</b> Jeff Piziali	<b>Art Unit</b> 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,12,13,30 and 33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,12,13,30 and 33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>14 August 2007</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance (mailed 17 May 2007) or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicants' submission filed on 27 July 2007 has been entered.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

3. The drawings were received on 23 June 2005. These drawings are acceptable.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2629

5. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 5 recites the limitation "said boundary" in line 3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 2, 5, 12, 13, 30, and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by *Takeuchi et al (US 6,483,492 B1)*.

Regarding claim 1, Takeuchi discloses a driving method of a liquid crystal element (see Column 45, Line 54 - Column 46, Line 30) for allowing said liquid crystal element to display a level of grayscale (see Column 2, Lines 4-9), said liquid crystal element displaying throughout a frame period by switching ON-state said liquid crystal element during a period corresponding to grayscale data that defines said level of grayscale (see Column 2, Lines 10-39), said method comprising: dividing the frame into a plurality of sub-fields (aka "display cycles"), the plurality of sub-fields having a first group of sub-fields [Fig. 38; unit display cycles Td2, Td3, Td4, for

Art Unit: 2629

example] continuous with respect to one another and a second group of sub-fields [Fig. 38; redundant display cycles TD1, TD2, TD3] continuous with respect to one another, the second group of sub-fields being subsequent (see Fig. 38; from left to right) to the first group of sub-fields, each of the first group of sub-fields having a same first sub-field period [Fig. 38; period U(1)], each of the second group of sub-fields having a same second sub-field period [Fig. 38; period U(4)] which is substantially equal to a sum of a length of the first sub-field periods (e.g.,  $Td2[U(1)] + Td3[U(1)] + Td4[U(1)]$ ) of the first group of sub-fields and a length (e.g.,  $Td2[U(1)]$ ) of any one of the first sub-field periods [wherein  $U(1) + U(1) + U(1) + U(1) = U(4)$ ]; selecting, according to the grayscale data, sub-fields that are adjacent to each other in a direction from a temporal position between the first group of sub-fields and the second group of sub-fields toward a sub-field of the first group of sub-fields or a sub-field of the second group of sub-fields at a position most remote from the temporal position; and driving by switching ON-state the liquid crystal element during period of the sub-fields selected (see Column 43, Lines 6-54).

Regarding claim 2, Takeuchi discloses said first group of sub-fields and said second group of sub-fields being included in a same frame period (see Figs. 38 & 46; Column 43, Lines 6-54 & Column 46, Lines 21-30).

Regarding claim 5, Takeuchi discloses, in said driving step, a period during which said liquid crystal element is switched ON-state being inserted in said boundary regardless of said grayscale data (see Fig. 38; Column 43, Lines 6-54).

Regarding claim 12, Takeuchi discloses said grayscale data being composed of N bits (N is an integer not less than 2) to define a level of grayscale having  $2$  to the  $N^{\text{th}}$  power kinds; high-order M bits in said N bits defining a level of grayscale said second group of sub-fields should display; low-order (N - M) bits in said N bits defining a level of grayscale said first group of sub-fields should display; and said M is an optimal solution of M given on an assumption that said frame period includes  $(2^{N-M} - 1)$  first sub-field periods (see Figs. 38-39; Column 43, Line 6 - Column 44, Line 27).

Regarding claim 13, Takeuchi discloses said grayscale data being composed of N bits (N is an integer not less than 2) to define a level of grayscale having  $2$  to the  $N^{\text{th}}$  power kinds; a length of each of said second sub-field periods being equal to a length of a period to display a level of grayscale defined by a least significant bit in high-order M bits in said N bits; the number of said second group of sub-fields being equal to a maximum value specified by said M bits; a length of each of said first sub-field periods being equal to a length of a period to display a level of grayscale defined by a least significant bit in low-order (N - M) bits in said N bits; and the number of said first group of sub-fields being equal to a maximum value specified by said (N - M) bits (see Figs. 38-39; Column 43, Line 6 - Column 44, Line 27).

Regarding claim 30, Takeuchi discloses a driving device [Figs. 9, 12, 17; driving circuits] of a liquid crystal element (see Column 45, Line 54 - Column 46, Line 30) for allowing said liquid crystal element to display a level of grayscale (see Column 2, Lines 4-9) said liquid crystal

Art Unit: 2629

element displays throughout a frame period by switching ON-state said liquid crystal element during a period corresponding to grayscale data that defines said level of grayscale (see Column 2, Lines 10-39), said device comprising: a dividing circuit that divides the frame into a plurality of sub-fields (aka "display cycles"), the plurality of sub-fields having a first group of sub-fields [Fig. 38; unit display cycles Td2, Td3, Td4, for example] continuous with respect to one another and a second group of sub-fields [Fig. 38; redundant display cycles TD1, TD2, TD3] continuous with respect to one another, the second group of sub-fields being subsequent (see Fig. 38; from left to right) to the first group of sub-fields, each of the first group of sub-fields having a same first sub-field period [Fig. 38; period U(1)], each of the second group of sub-fields having a same second sub-field period [Fig. 38; period U(4)] which is substantially equal to a sum of a length (e.g.,  $Td2[U(1)] + Td3[U(1)] + Td4[U(1)]$ ) of the first sub-field periods of the first group of sub-fields and a length (e.g.,  $Td2[U(1)]$ ) of any one of the first sub-field periods [wherein  $U(1) + U(1) + U(1) = U(4)$ ]; a selecting circuit that selects, according to the grayscale data, sub-fields that are adjacent to each other in a direction from a temporal position between the first group of sub-fields and the second group of sub-fields toward a sub-field of the first group of sub-fields or a sub-field of the second group of sub-fields at a position most remote from the temporal position; and a driving circuit that switches ON-state said liquid crystal element during period of the sub-fields selected (see Column 43, Lines 6-54).

Regarding claim 33, Takeuchi discloses electronic equipment, comprising: a display device, including a plurality of driving device driven liquid crystal elements aligned in a matrix,

Art Unit: 2629

that displays an image related to said electronic equipment (see Figs. 9, 12, 17; Column 45, Line 54 - Column 46, Line 30).

***Response to Arguments***

9. Applicants' arguments with respect to claims 1, 2, 5, 12, 13, 30, and 33 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Piziali whose telephone number is (571) 272-7678. The examiner can normally be reached on Monday - Friday (6:30AM - 3PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jeff Piziali  
15 October 2007